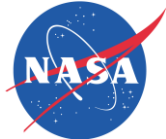




Giovanni-4: The Next Generation

*C Lynnes, M Hegde, C Smit, D DaSilva, K
Bryant, P. Zhao, Z. Liu, S. Shen,
A. Savtchenko, W. Teng, J. Wei, J. Acker*

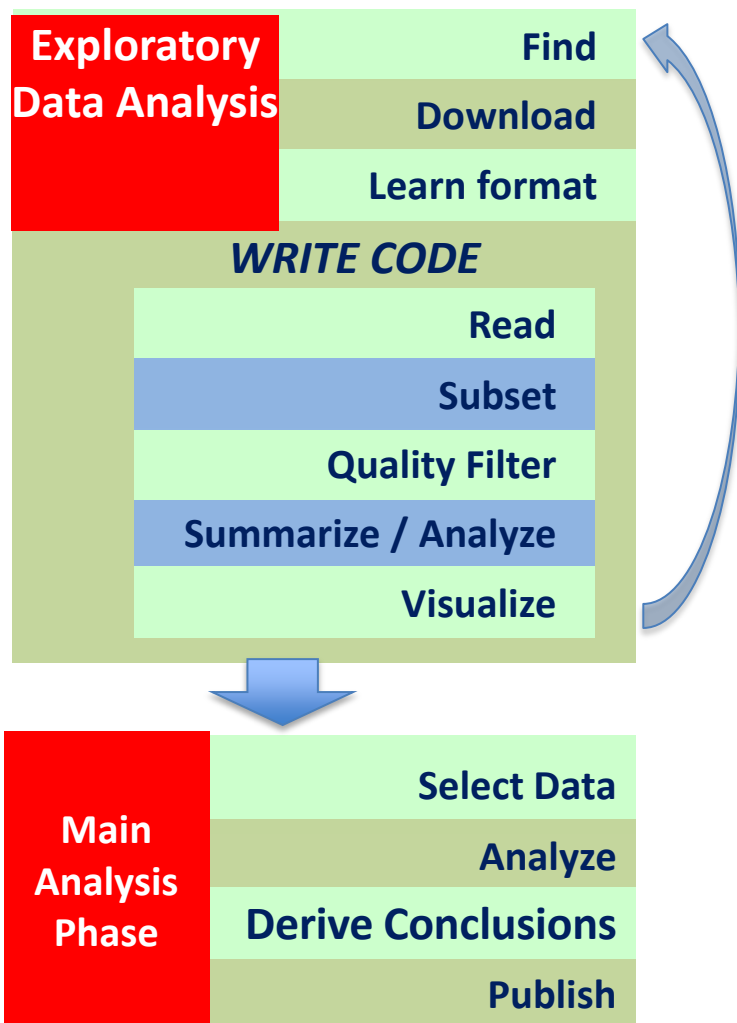


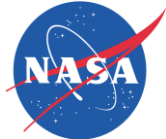
Outline

- Overview of Giovanni
- New and Notable Features
- Discussion?

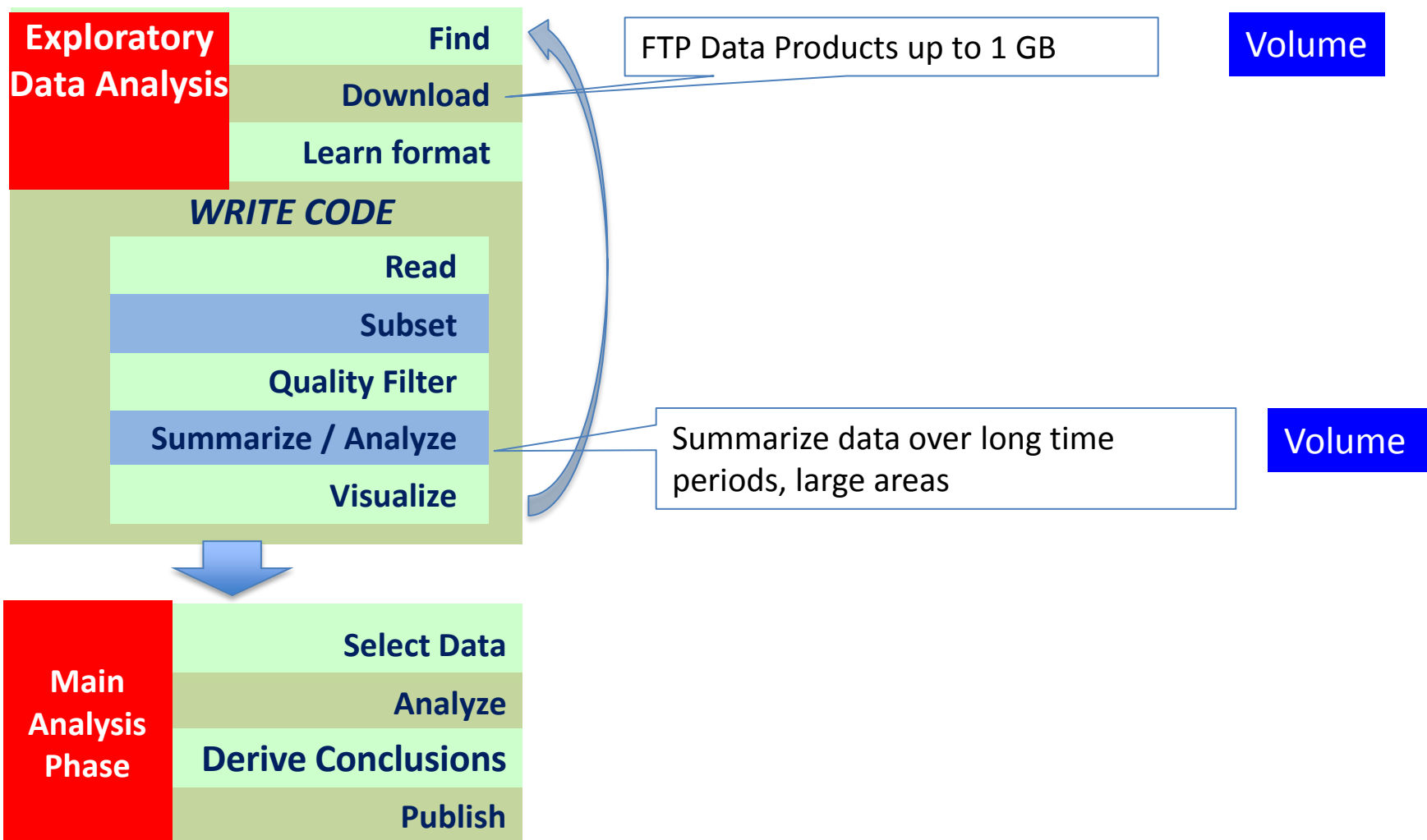


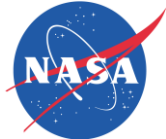
Giovanni and “Big Data”



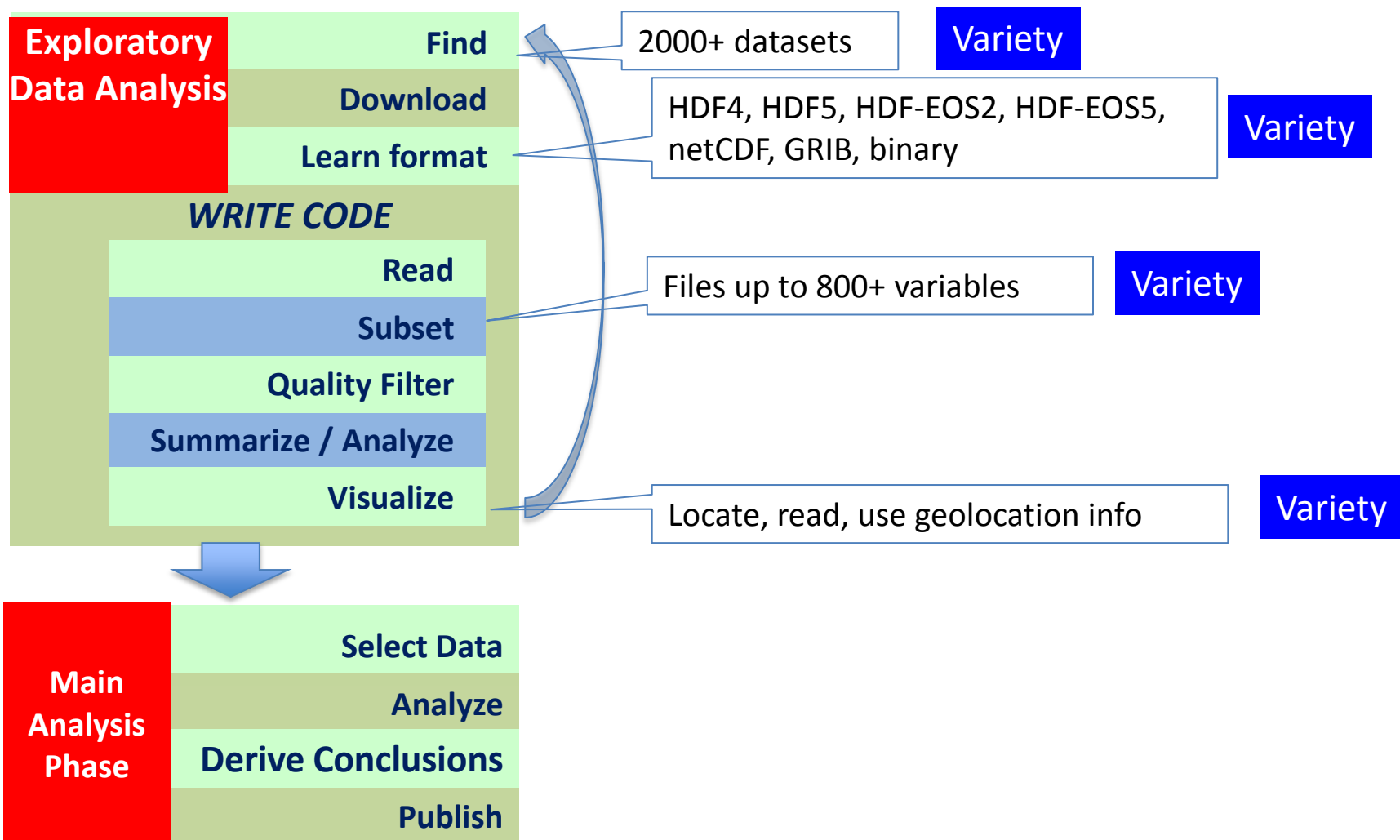


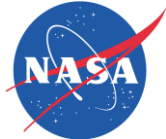
Why So Difficult?



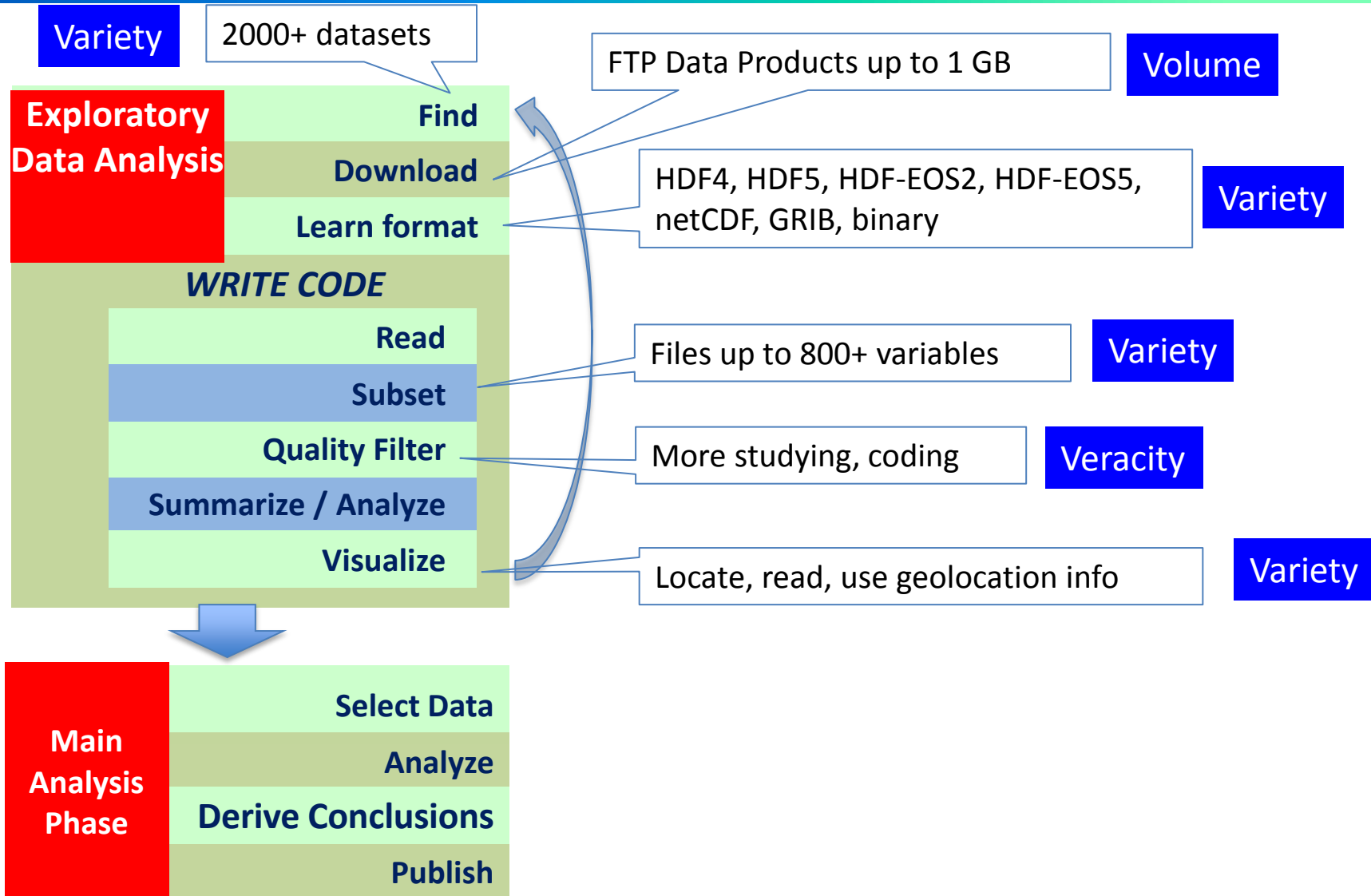


Why So Difficult?



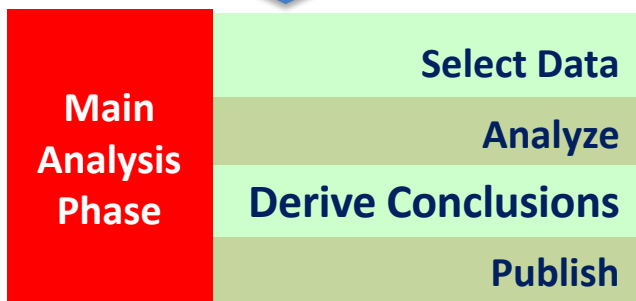
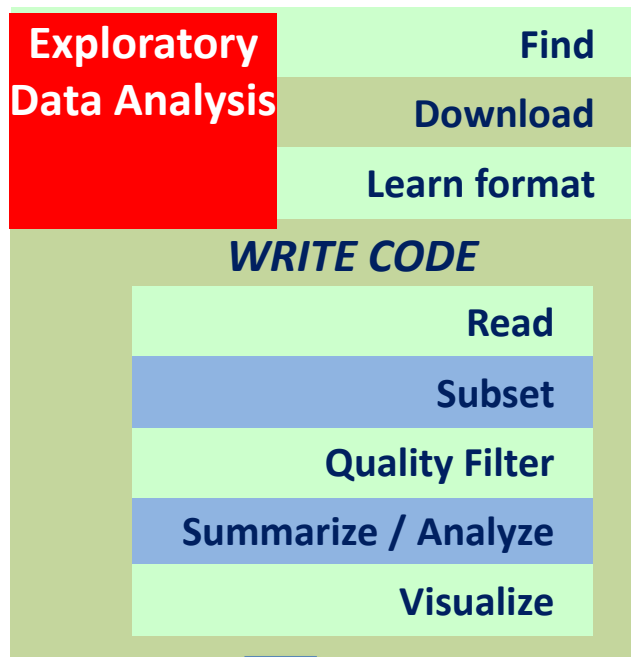


Remote Sensing Science: Why So Difficult?



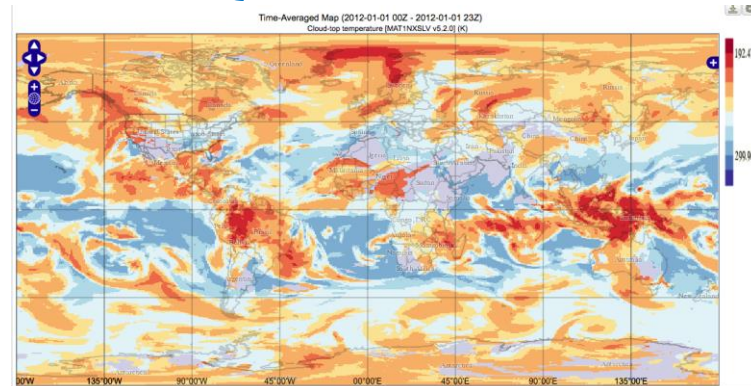
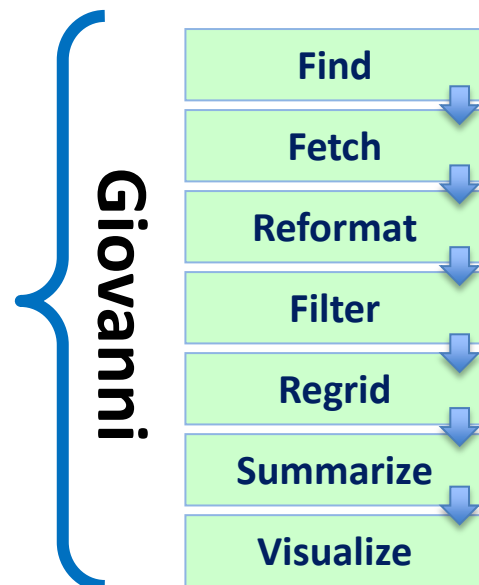


Giovanni provides (relatively) rapid exploration of datasets



Giovanni provides
*Server-Side,
Quick-Start
Exploratory Data
Analysis:*
no coding necessary
no downloads necessary

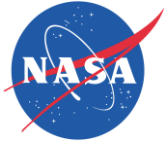
Web-based Services





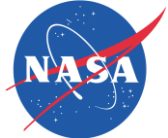
What's New?

- Giovanni-4, relative to Giovanni-3
 - Omnibus Giovanni Portal
 - Federated Giovanni
 - Variable selection interface
 - Sharable/reproducible URLs
- New in Giovanni-4
 - More comparison functions
 - Vector Plots
 - Seasonal Analysis
 - Shapefile-based Area Averages



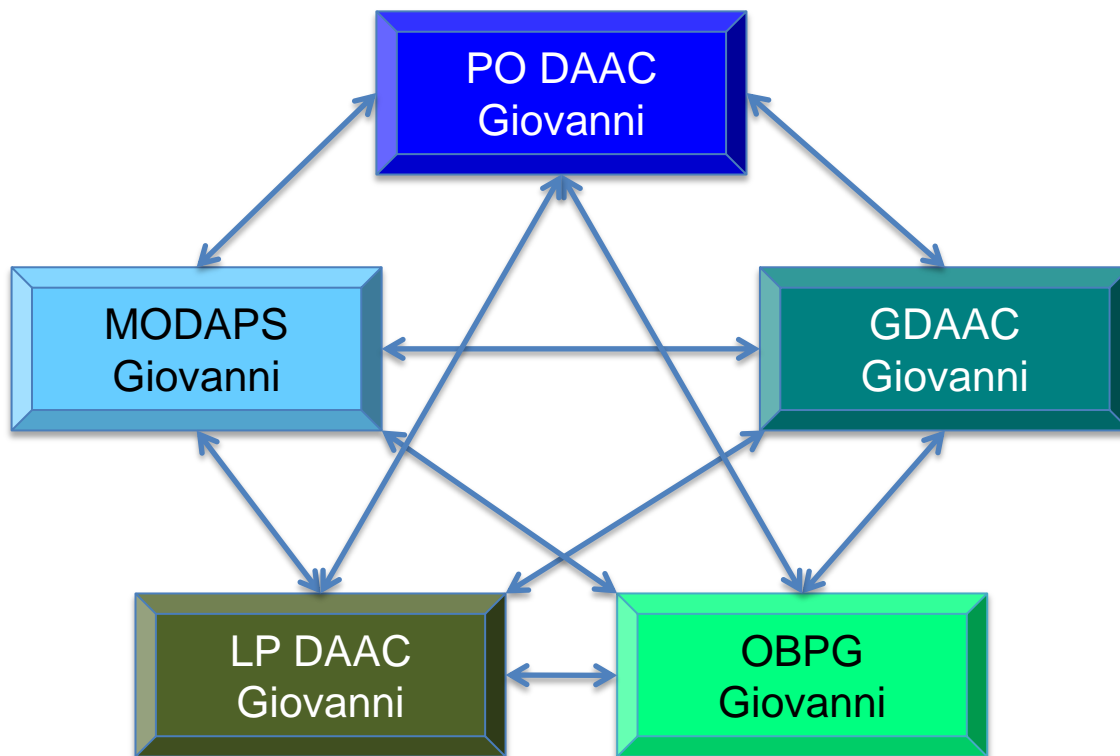
Omnibus Portal

- All variables in one portal
 - Compare across instruments and disciplines
 - Caveat: Multi-temporal comparisons not yet supported
- However: Requires more navigational aids



Federated Giovanni will further increase the availability of data in Giovanni

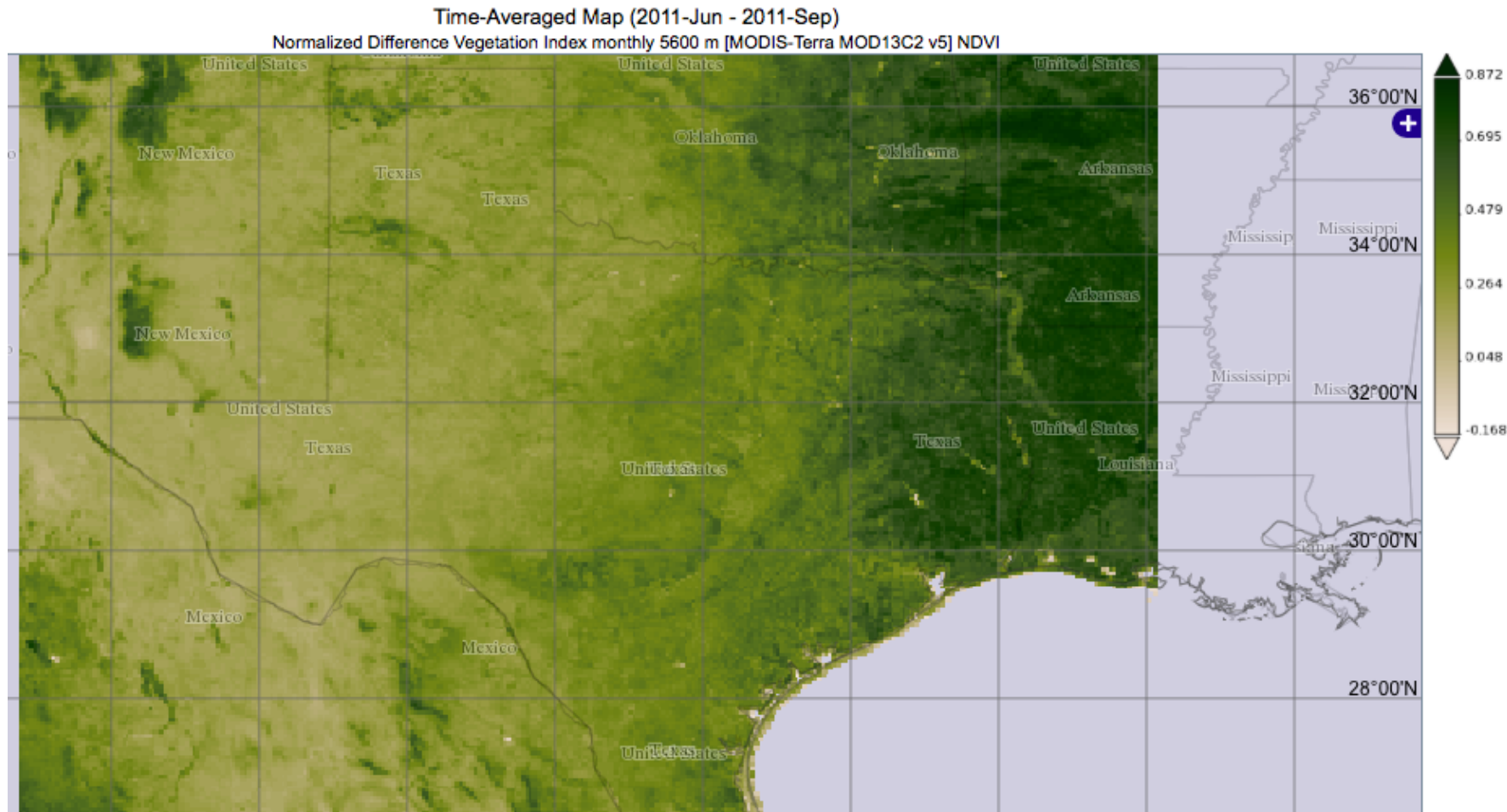
- Ongoing now: Funded by NASA-ACCESS: 2014-2016

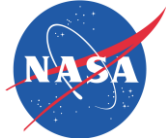


- Eventual release of source and Virtual Machine to the community

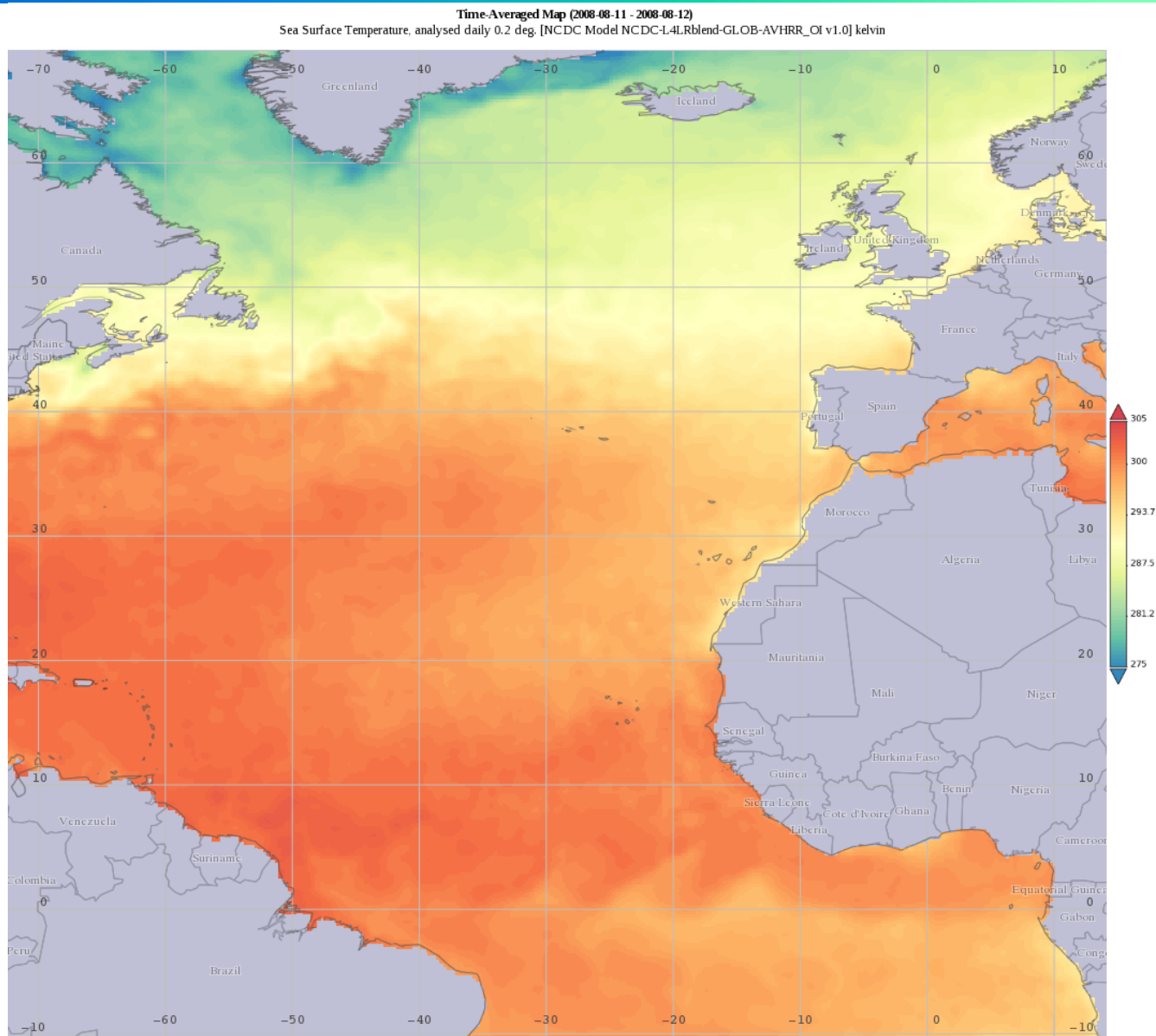


MODIS NDVI from LP DAAC





SST from PO.DAAC





Giovanni-4 User Interface

Giovanni

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NLDAS Soil Moisture Content variables temporarily unavailable... [1 of 2 messages] [Read More](#)

Select Plot

Choose a plot type.

☒ Maps: Time-Averaged

☐ Comparisons: Select...

☐ Time Series: Select...

☐ Vertical: Select...

☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD

2011 -01 -01

00 hrs

to

2011 -01 -02

23 hrs

Valid Range: 2000-03-01 to 2014-10-13

Select Region (Bounding Box)

Format: West, South, East, North

-127.2656, 24.6094, -67.5, 50.625



Select Variables

Disciplines

☐ Aerosols (8)

Measurements

☐ Angstrom Exponent (4)

☐ Statistics (2)

☐ Total Aerosol Optical Depth (2)

Platform / Instrument

Wavelengths

Spatial Resolutions

Temporal Resolutions

Al

Number of matching Variables: 8 of 219

Keyword : Dark Targ

Search

Clear

	Dark Target	Temp. Res.	Spat. Res.	Begin Date	End Date	Vert. Slice	
<input type="checkbox"/>	Pixel Count of Aerosol Optical Depth 550 nm (Dark Target) (MYD08_D3 v051)	MODIS-Aqua	Daily	1 °	2002-07-04	2014-10-24	-
<input type="checkbox"/>	Aerosol Optical Depth 550 nm (Dark Target) (MYD08_D3 v051)	MODIS-Aqua	Daily	1 °	2002-07-04	2014-10-24	-
<input type="checkbox"/>	Aerosol Angstrom Exponent 470/660 nm (Dark Target, Land-only) (MYD08_D3 v051)	MODIS-Aqua	Daily	1 °	2002-07-04	2014-10-24	-
<input type="checkbox"/>	Aerosol Angstrom Exponent 550/865 nm (Dark Target, Ocean-only) (MYD08_D3 v051)	MODIS-Aqua	Daily	1 °	2002-07-04	2014-10-24	-
<input type="checkbox"/>	Pixel Count of Aerosol Optical Depth 550 nm (Dark Target) (MOD08_D3 v051)	MODIS-Terra	Daily	1 °	2000-03-01	2014-10-13	-
<input type="checkbox"/>	Aerosol Angstrom Exponent 470/660 nm (Dark Target, Land-only) (MOD08_D3 v051)	MODIS-Terra	Daily	1 °	2000-03-01	2014-10-13	-
<input type="checkbox"/>	Aerosol Angstrom Exponent 550/865 nm (Dark Target, Ocean-only) (MOD08_D3 v051)	MODIS-Terra	Daily	1 °	2000-03-01	2014-10-13	-
<input checked="" type="checkbox"/>	Aerosol Optical Depth 550 nm (Dark Target) (MOD08_D3 v051)	MODIS-Terra	Daily	1 °	2000-03-01	2014-10-13	-

Sortable columns

Search with Autosuggest

Total Variable(s) included in Plot: 1

Faceted Browse

Help

Reset

Feedback

Plot Data

GES - DISC

Goddard Earth Sciences
Data Information Services Center

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NASA Earth Data

Data Discovery

Data Centers

Community

Science Disciplines

Search EOSDIS

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Select Plot

Choose a plot type.

☒ Maps: Time-Averaged

☐ Comparisons: Select...

☐ Time Series: Select...

☐ Vertical: Select...

☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD

00 hrs

 to

23 hrs

Valid Range: 1979-01-01 to 2014-11-04

Please specify a start date.

Select Region (Bounding Box)

Format: West, South, East, North

-180, -90, 180, 90

Select Variables

Disciplines

☐ Aerosols (118)

☐ Atmospheric Chemistry (12)

☐ Atmospheric Dynamics (62)

☐ Hydrology (16)

☐ Water and Energy Cycle (26)

▶ Measurements

▶ Platform / Instrument

▶ Wavelengths

▶ Depths

▶ Spatial Resolutions

▶ Temporal Resolutions

Number of matching Variables: 0 of 219

Keyword :

Search Clear

Total Variable(s) included in Plot: 0

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Webmaster: M. Henderson@nasa.gov

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Keyword search on precipitation

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Select Plot

Choose a plot type.

☒ Maps: Time-Averaged ☐ Comparisons: Select... ☐ Time Series: Select... ☐ Vertical: Select... ☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD

00 hrs to 23 hrs

Valid Range: 1979-01-01 to 2014-11-04

Please specify a start date.

Select Region (Bounding Box)

Format: West, South, East, North

-180, -90, 180, 90

Select Variables

Disciplines

- ☐ Hydrology (6)
- ☐ Water and Energy Cycle (1)

Measurements

Platform / Instrument

Spatial Resolutions

Temporal Resolutions

Portal

Number of matching Variables: 6 of 219

Keyword: precipitation Search Clear

Total Variable(s) included in Plot: 0

	Variable Name	Source	Temp. Res.	Spat. Res.	Begin Date	End Date	Vert. Slice
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_M v002)	NLDAS Model	Monthly	0.125 °	1979-01-01	2014-09-30	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B43 v7)	TRMM	Monthly	0.25 °	1998-01-01	2014-08-31	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B43 v6)	TRMM	Monthly	0.25 °	1998-01-01	2011-06-30	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v7)	TRMM	Daily	0.25 °	1997-12-31	2014-08-31	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v6)	TRMM	Daily	0.25 °	1997-12-31	2011-06-30	-
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-01	2014-10-31	-

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Select Plot

Choose a plot type.

☒ Maps: Time-Averaged ☐ Comparisons: Select... ☐ Time Series: Select... ☐ Vertical: Select... ☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD

00 hrs to 23 hrs

Valid Range: 1979-01-01 to 2014-11-04

Please specify a start date.

Select Region (Bounding Box)

Format: West, South, East, North

-180, -90, 180, 90

Select Variables

Number of matching Variables: 0 of 219

Keyword :

Total Variable(s) included in Plot: 0

▼ Disciplines

- ☐ Aerosols (118)
- ☐ Atmospheric Chemistry (12)
- ☐ Atmospheric Dynamics (62)
- ☐ Hydrology (16)
- ☐ Water and Energy Cycle (26)

▼ Measurements

- ☐ Aerosol Index (1)
- ☐ Air Pressure (4)
- ☐ Air Temperature (14)
- ☐ Albedo (5)
- ☐ Altitude (4)
- ☐ Angstrom Exponent (16)
- ☐ Atmospheric Moisture (20)
- ☐ CH4 (4)
- ☐ CO (4)
- ☐ Cloud Fraction (4)

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Select Plot

Choose a plot type.

☒ Maps: Time-Averaged ☐ Comparisons: Select... ☐ Time Series: Select... ☐ Vertical: Select... ☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD

00 hrs to 23 hrs

Valid Range: 1979-01-01 to 2014-11-04

Please specify a start date.

Select Variables

Disciplines

- ☐ Aerosols (118)
- ☐ Atmospheric Chemistry (12)
- ☐ Atmospheric Dynamics (62)
- ☒ Hydrology (16)
- ☐ Water and Energy Cycle (26)

Measurements

Platform / Instrument

Depths

Spatial Resolutions

Temporal Resolutions

Portal

Number of matching Variables: 16 of 219

Keyword :

	Variable Name	Source	Temp. Res.	Spat. Res.	Begin Date	End Date	Vert. Slice
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v6)	TRMM	Daily	0.25 °	1997-12-31	2011-06-30	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v7)	TRMM	Daily	0.25 °	1997-12-31	2014-08-31	-
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-01	2014-10-31	-
<input type="checkbox"/>	Evapotranspiration Total (NLDAS_NOAH0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-02	2014-10-31	-
<input type="checkbox"/>	Soil Moisture Content Layer 1 (0-10 cm) (NLDAS_NOAH0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-02	2014-10-31	-
<input type="checkbox"/>	Soil Moisture Content Top 1 Meter (0-100 cm) (NLDAS_NOAH0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-02	2014-10-31	-
<input type="checkbox"/>	Soil Moisture Content Total Column (0-200 cm) (NLDAS_NOAH0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-02	2014-10-31	-

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Select Plot
Choose a plot type.

☒ Maps: Time-Averaged ☐ Comparisons: Select... ☐ Time Series: Select... ☐ Vertical: Select... ☐ Miscellaneous: Select...

Select Date Range (UTC)
YYYY-MM-DD
00 hrs to 23 hrs
Valid Range: 1979-01-01 to 2014-11-04
Please specify a start date.

Select Region (Bounding Box)
Format: West, South, East, North
-180, -90, 180, 90

Select Variables

Disciplines

- ☐ Aerosols (118)
- ☐ Atmospheric Chemistry (12)
- ☐ Atmospheric Dynamics (62)
- ☒ Hydrology (16)
- ☐ Water and Energy Cycle (26)

Measurements

Platform / Instrument

Depths

Spatial Resolutions

Temporal Resolutions

Portal

Number of matching variables: 16 of 219

Keyword: Search Clear

	Variable Name	Source	Temp. Res.	Spat. Res.	Begin Date	End Date	Vert. Slice
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v6)	TRMM	Daily	0.25 °	1997-12-31	2011-06-30	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v7)	TRMM	Daily	0.25 °	1997-12-31	2014-08-31	-
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-01	2014-10-31	-
<input type="checkbox"/>	Evapotranspiration Total (NLDAS_NOAH0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-02	2014-10-31	-
<input type="checkbox"/>	Soil Moisture Content Layer 1 (0-10 cm) (NLDAS_NOAH0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-02	2014-10-31	-
<input type="checkbox"/>	Soil Moisture Content Top 1 Meter (0-100 cm) (NLDAS_NOAH0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-02	2014-10-31	-
<input type="checkbox"/>	Soil Moisture Content Total Column (0-200 cm) (NLDAS_NOAH0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-02	2014-10-31	-

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Select Plot

Choose a plot type.

☒ Maps: Time-Averaged ☐ Comparisons: Select... ☐ Time Series: Select... ☐ Vertical: Select... ☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD

00 hrs to 23 hrs

Valid Range: 1979-01-01 to 2014-11-04

Please specify a start date.

Select Variables

Disciplines

- ☒ Hydrology (6)
- ☐ Water and Energy Cycle (1)

Measurements

- ☐ Air Temperature (2)
- ☐ Evapotranspiration (1)
- ☒ Precipitation (6)
- ☐ Soil Moisture (6)
- ☐ Surface Runoff (1)

Platform / Instrument

Spatial Resolutions

Temporal Resolutions

Portal

Number of matching Variables: 6 of 219

Keyword :

	Variable Name	Source	Temp. Res.	Spat. Res.	Begin Date	End Date	Vert. Slice
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v6)	TRMM	Daily	0.25 °	1997-12-31	2011-06-30	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v7)	TRMM	Daily	0.25 °	1997-12-31	2014-08-31	-
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-01	2014-10-31	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B43 v7)	TRMM	Monthly	0.25 °	1998-01-01	2014-08-31	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B43 v6)	TRMM	Monthly	0.25 °	1998-01-01	2011-06-30	-
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_M v002)	NLDAS Model	Monthly	0.125 °	1979-01-01	2014-09-30	-

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Select Plot

Choose a plot type.

☒ Maps: Time-Averaged ☐ Comparisons: Select... ☐ Time Series: Select... ☐ Vertical: Select... ☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD

00 hrs to 23 hrs

Valid Range: 1997-12-31 to 2014-08-31

Please specify a start date. Maximum range is 61368 days

Select Region (Bounding Box)

Format: West, South, East, North

-180, -90, 180, 90

Select Variables

▼ Disciplines

- ☒ Hydrology (6)
- ☐ Water and Energy Cycle (1)

▼ Measurements

- ☐ Air Temperature (2)
- ☐ Evapotranspiration (1)
- ☒ Precipitation (6)
- ☐ Soil Moisture (6)
- ☐ Surface Runoff (1)

► Platform / Instrument

► Spatial Resolutions

► Temporal Resolutions

► Portal

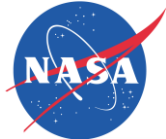
Number of matching Variables: 6 of 219

Total Variable(s) included in Plot: 1

Keyword :

	Variable Name	Source	Temp. Res.	Spat. Res.	Begin Date	End Date	Vert. Slice
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v6)	TRMM	Daily	0.25 °	1997-12-31	2011-06-30	-
<input checked="" type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v7)	TRMM	Daily	0.25 °	1997-12-31	2014-08-31	-
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-01	2014-10-31	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B43 v7)	TRMM	Monthly	0.25 °	1998-01-01	2014-08-31	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B43 v6)	TRMM	Monthly	0.25 °	1998-01-01	2011-06-30	-
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_M v002)	NLDAS Model	Monthly	0.125 °	1979-01-01	2014-09-30	-

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Select Plot

Choose a plot type.

☒ Maps: Time-Averaged ☐ Comparisons: Select... ☐ Time Series: Select... ☐ Vertical: Select... ☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD

00 hrs to 23 hrs

Valid Range: 1997-12-31 to 2014-08-31

Please specify a start date. Maximum range is 61368 days

Select Region (Bounding Box)

Format: West, South, East, North

-180, -90, 180, 90

Select Variables

▼ Disciplines

- ☒ Hydrology (6)
- ☐ Water and Energy Cycle (1)

▼ Measurements

- ☐ Air Temperature (2)
- ☐ Evapotranspiration (1)
- ☒ Precipitation (6)
- ☐ Soil Moisture (6)
- ☐ Surface Runoff (1)

► Platform / Instrument

► Spatial Resolutions

► Temporal Resolutions

► Portal

Number of matching Variables: 6 of 219

Keyword :

	Variable Name	Source	Temp. Res.	Spat. Res.	Begin Date	End Date	Vert. Slice
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v6)	TRMM	Daily	0.25 °	1997-12-31	2011-06-30	-
<input checked="" type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v7)	TRMM	Daily	0.25 °	1997-12-31	2014-08-31	-
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-01	2014-10-31	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B43 v7)	TRMM	Monthly	0.25 °	1998-01-01	2014-08-31	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B43 v6)	TRMM	Monthly	0.25 °	1998-01-01	2011-06-30	-
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_M v002)	NLDAS Model	Monthly	0.125 °	1979-01-01	2014-09-30	-

Total Variable(s) included in Plot: 1

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You can also sort on columns

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Giovanni

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Select Plot

Choose a plot type.

☒ Maps: Time-Averaged ☐ Comparisons: Select... ☐ Time Series: Select... ☐ Vertical: Select... ☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD

00 hrs to 23 hrs

Valid Range: 1997-12-31 to 2014-08-31

Please specify a start date. Maximum range is 61368 days

Select Region (Bounding Box)

Format: West, South, East, North

-180, -90, 180, 90

Select Variables

▼ Disciplines

- ☒ Hydrology (6)
- ☐ Water and Energy Cycle (1)

▼ Measurements

- ☐ Air Temperature (2)
- ☐ Evapotranspiration (1)
- ☒ Precipitation (6)
- ☐ Soil Moisture (6)
- ☐ Surface Runoff (1)

► Platform / Instrument

► Spatial Resolutions

► Temporal Resolutions

► Portal

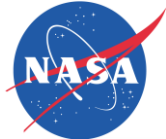
Number of matching Variables: 6 of 219

Keyword :

	Variable Name	Source	Temp. Res.	Spat. Res.	Begin Date	End Date	Vert. Slice
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_H v002)	NLDAS Model	Hourly	0.125 °	1979-01-01	2014-10-31	-
<input type="checkbox"/>	Precipitation Total (NLDAS_FORA0125_M v002)	NLDAS Model	Monthly	0.125 °	1979-01-01	2014-09-30	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B43 v7)	TRMM	Monthly	0.25 °	1998-01-01	2014-08-31	-
<input checked="" type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v7)	TRMM	Daily	0.25 °	1997-12-31	2014-08-31	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B43 v6)	TRMM	Monthly	0.25 °	1998-01-01	2011-06-30	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v6)	TRMM	Daily	0.25 °	1997-12-31	2011-06-30	-

Help Reset Feedback

Responsible NASA Official: Steven.J.Kempner@nasa.gov Powered By: [Giovanni](#) [Contact Us](#)



Spatial and temporal resolution facets are also available

giovanni.gsfc.nasa.gov

NASA Earth Data Data Discovery Data Centers Community Science Disciplines Search EOSDIS

Giovanni

The Bridge Between Data and Science v 4.10 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Select Plot

Choose a plot type.

☒ Maps: Time-Averaged ☐ Comparisons: Select... ☐ Time Series: Select... ☐ Vertical: Select... ☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD

00 hrs to 23 hrs

Valid Range: 1997-12-31 to 2014-08-31

Please specify a start date. Maximum range is 61368 days

Select Region (Bounding Box)

Format: West, South, East, North

-180, -90, 180, 90

Select Variables

Number of matching Variables: 2 of 219

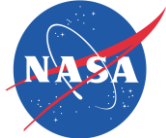
Keyword: Search Clear

Total Variable(s) included in Plot: 1

	Variable Name	Source	Temp. Res.	Spat. Res.	Begin Date	End Date	Vert. Slice
<input checked="" type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v7)	TRMM	Daily	0.25 °	1997-12-31	2014-08-31	-
<input type="checkbox"/>	Precipitation Rate (TRMM_3B42_daily v6)	TRMM	Daily	0.25 °	1997-12-31	2011-06-30	-

Help Reset Feedback Plot Data

Responsible NASA Official: Steven.J.Kempler@nasa.gov Powered By: [Contact Us](#)



Giovanni-4 selections are encoded in the URL Making them Sharable and Reproducible

`http://giovanni.gsfc.nasa.gov/giovanni/#`

`service=INTERACTIVE_MAP&`

`starttime=2001-01-01T00:00:00Z&`

`endtime=2001-01-31T23:59:59Z&`

`bbox=-124.4531,24.2578,-68.2031,52.3828&`

`data=MOD08_D3_051_Optical_Depth_Land_And_Ocean_Mean&`

`variableFacets=dataFieldDiscipline%3AAerosols%3B`

Service

Time
Range

Bounding
Box

Data
Variable



Giovanni-4 URLs are Sharable and Reproducible

Service

Select Plot

Choose a plot type.

☒ Maps: Time-Averaged ☐ Comparisons: Select... ☐ Time Series: Select... ☐ Vertical: Select... ☐ Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD

2001-01-01 00 hrs to 2001-01-31 23 hrs

Valid Range: 2000-03-01 to 2014-10-13

Select Region (Bounding Box)

Format: West, South, East, North

-124.4531, 24.2578, -68.2031, 52.3828

Bounding Box

Time Range

Select Variables

Disciplines

- ☒ Aerosols (118)
- ☐ Atmospheric Chemistry (12)
- ☐ Atmospheric Dynamics (62)
- ☐ Hydrology (16)
- ☐ Water and Energy Cycle (26)

Measurements

Platform / Instrument

Wavelengths

Spatial Resolutions

Temporal Resolutions

Portal

Number of matching Variables: 118 of 219

Total Variable(s) included in Plot: 1

Keyword :

Search Clear

	Variable Name	Source	Temp. Res.	Spat. Res.	Begin Date	End Date
<input checked="" type="checkbox"/>	Aerosol Optical Depth 550 nm (Dark Target) (MOD08_D3 v051)	MODIS-Terra	Daily	1 °	2000-03-01	2014-10-13
<input type="checkbox"/>	Aerosol Angstrom Exponent 550/865 nm (Dark Target, Ocean-only) (MOD08_D3 v051)	MODIS-Terra	Daily	1 °	2000-03-01	2014-10-13
<input type="checkbox"/>	Aerosol Angstrom Exponent 470/660 nm (Dark Target, Land-only) (MOD08_D3 v051)	MODIS-Terra	Daily	1 °	2000-03-01	2014-10-13
<input type="checkbox"/>	Pixel Count of Aerosol Optical Depth 550 nm (Dark Target) (MOD08_D3 v051)	MODIS-Terra	Daily	1 °	2000-03-01	2014-10-13
<input type="checkbox"/>	Aerosol Optical Depth 550 nm (Deep Blue, Land-only) (MOD08_D3 v051)	MODIS-Terra	Daily	1 °	2000-03-01	2007-12-31

Data Variable

Help

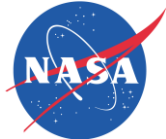
Reset

Feedback

Plot Data

GES - DISC

Goddard Earth Sciences
Data Information Services Center



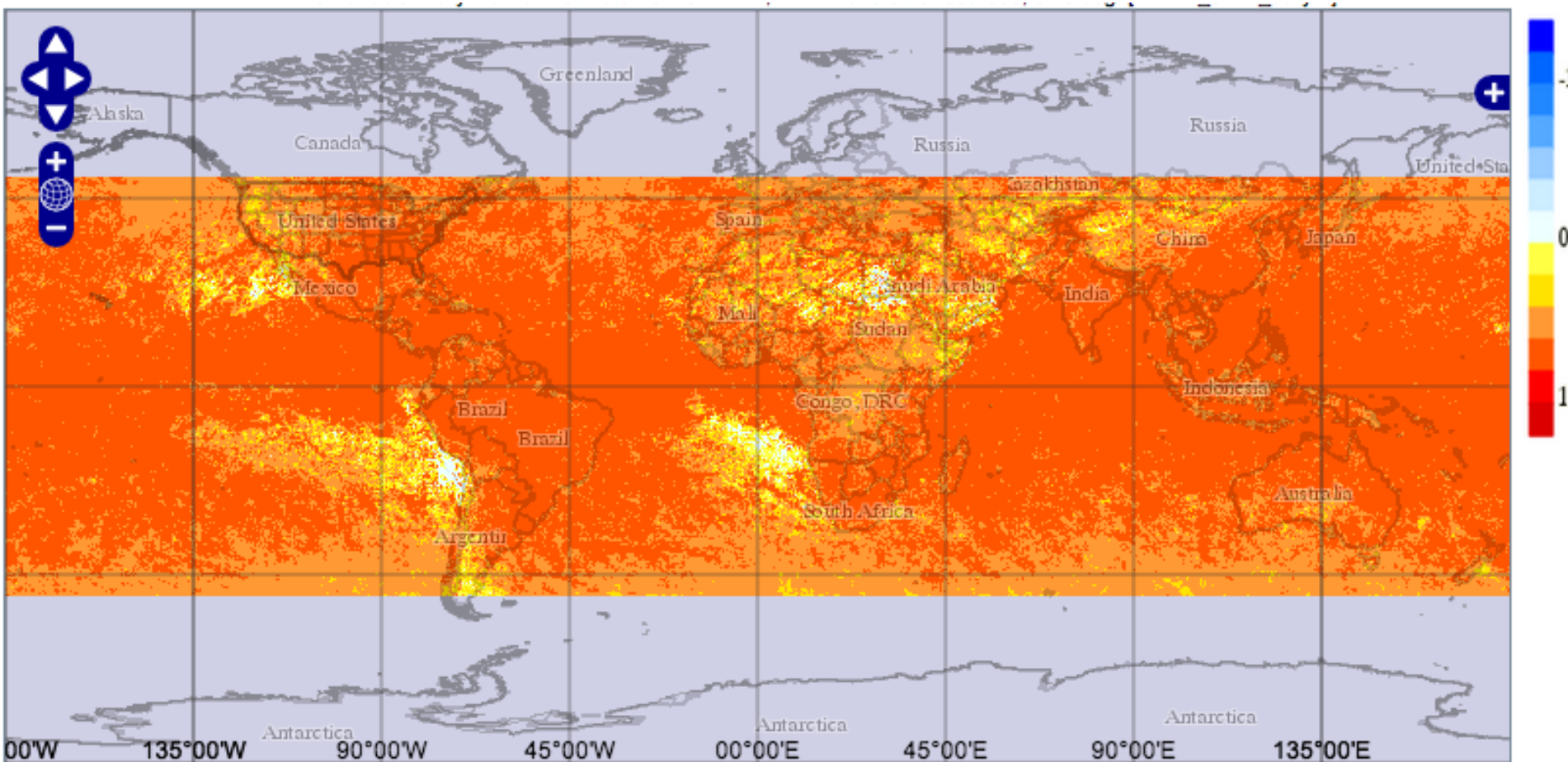
Data comparison services to compare similar datasets

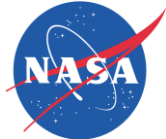
- Correlation Map
- Difference of Time-Averaged Maps
- Time Averaged Scatterplot
- Area Averaged Scatterplot
- Time Series of Differences of Area Averages



Correlation Map: TRMM Rainfall Versions 6 vs. 7

2010-2011



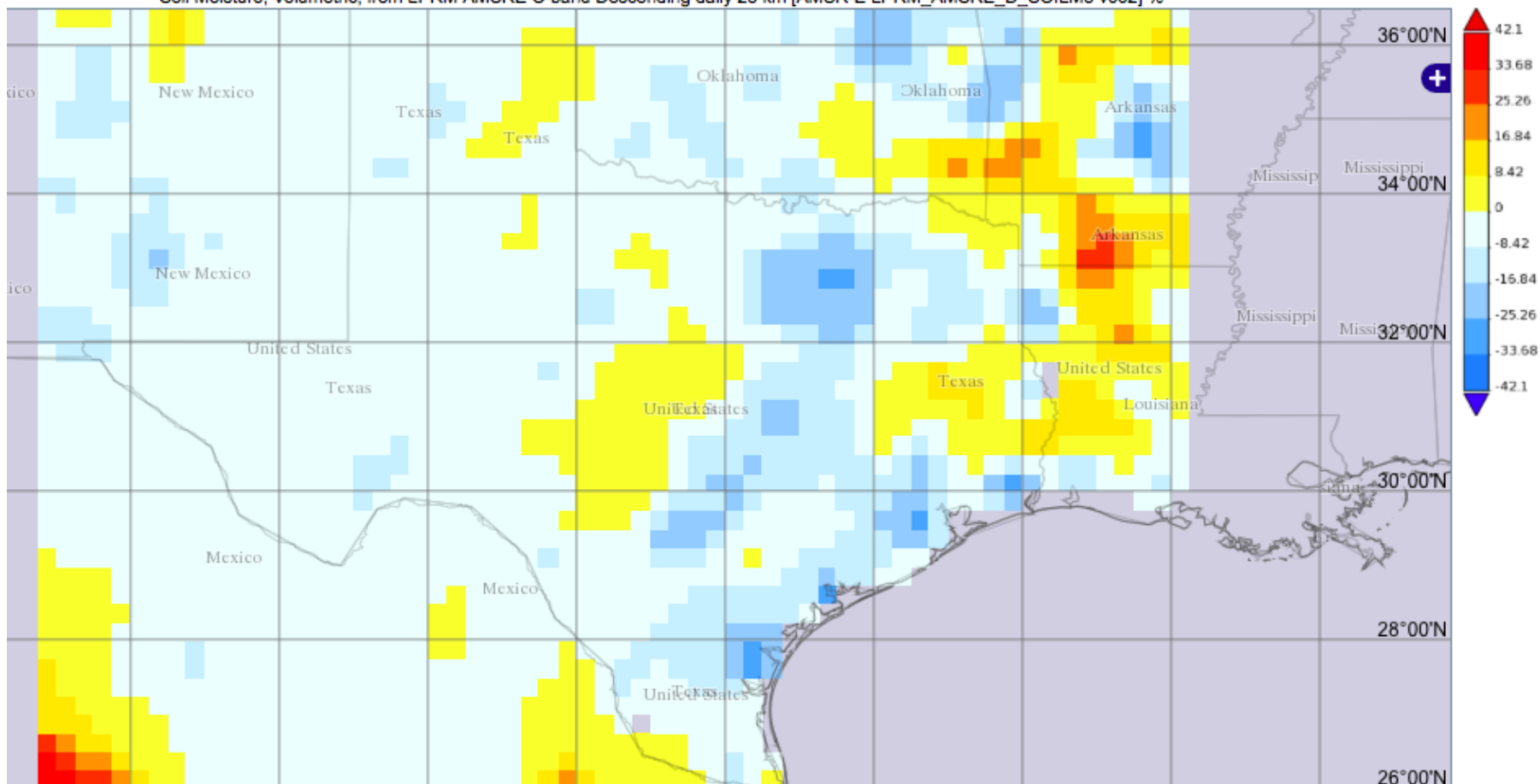


Difference of Time-Averaged Maps

Map, Difference of Time Averaged over 2011-06-01 - 2011-09-30, Region 107.2266W, 26.042N, 91.8457W, 36.6768N

Soil Moisture, Volumetric, from LPRM AMSRE X-band Descending daily 25 km [AMSR-E LPRM_AMSRE_D_SOILM3 v002] % minus

Soil Moisture, Volumetric, from LPRM AMSRE C-band Descending daily 25 km [AMSR-E LPRM_AMSRE_D_SOILM3 v002] %



- LPRM from X-band is more affected by vegetation than by C. This difference map shows that C and X don't differ that much when the surface is bare to sparsely vegetated, but do differ when the surface is more densely vegetated and soil moisture retrieval becomes problematic. (Courtesy Bill Teng)



New Services

- Vector Plots
- Seasonal Analysis
 - User-defined Climatology
 - Interannual Time Series
- Shapefile-based Area Average Time Series

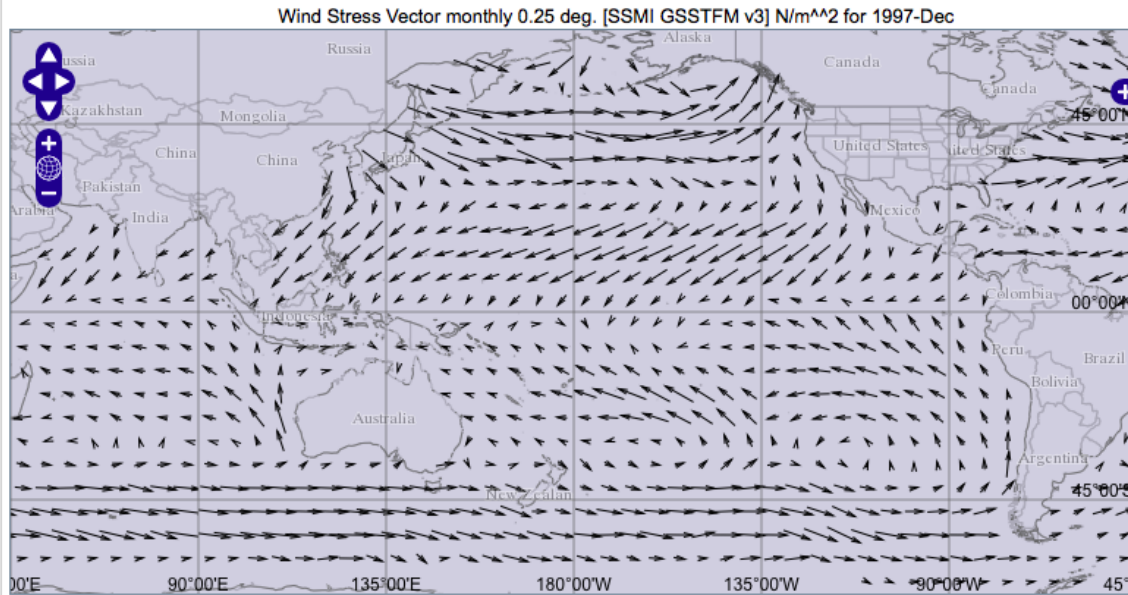


Vector Plots

- Available for some wind-related variables
 - More coming soon...
- Time Averaged Map service only
- Computes averages of U and V, then vector magnitude + direction

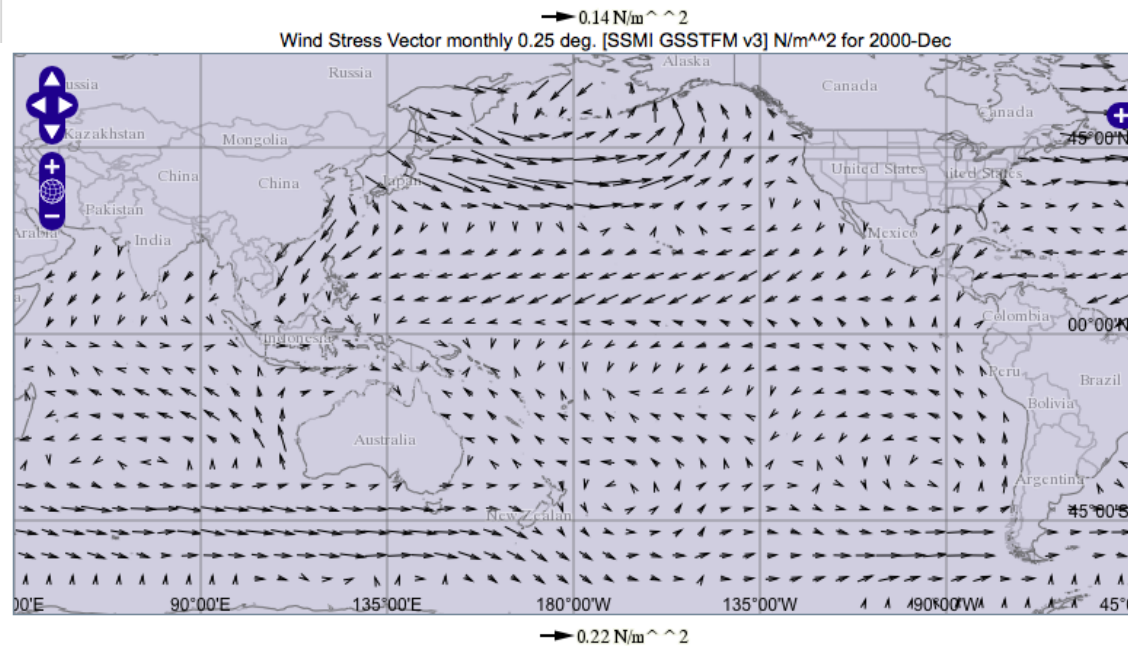


Vector Plots (Time-Averaged Map)



Wind Stress

Dec 1997 (El Nino)



Dec 2000 (La Nina)

Courtesy Chung-Lin Shie



User-Defined Climatology




Available for Monthly data

Aggregate by Month or Meteorological Season (DJF, MAM, JJA, SON)

Select Plot
Choose a plot type.

☒ **Maps: User-Defined Climatology** ▼ ☐ Comparisons: *Select...* ▼

Select Seasonal Dates
Month or Season and YYYY range.

March, September  2001  to 2013 

Select months or seasons 4-10-29

☒ Months ☐ Seasons

<input type="checkbox"/> January	<input type="checkbox"/> July
<input type="checkbox"/> February	<input type="checkbox"/> August
<input checked="" type="checkbox"/> March	<input checked="" type="checkbox"/> September
<input type="checkbox"/> April	<input type="checkbox"/> October
<input type="checkbox"/> May	<input type="checkbox"/> November
<input type="checkbox"/> June	<input type="checkbox"/> December

Wavelengths

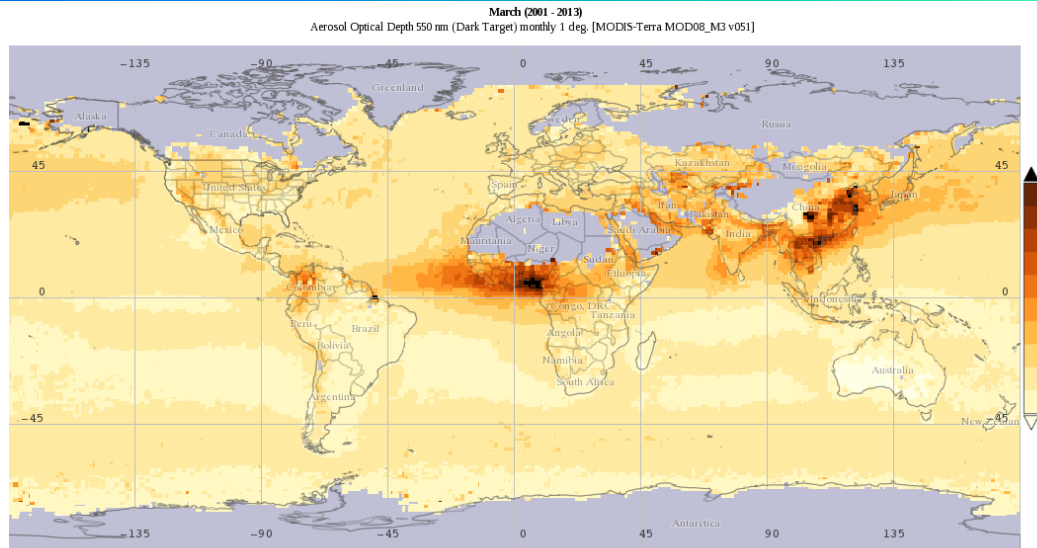
Number of matching Variables: 2

Keyword :

	Variable
<input checked="" type="checkbox"/>	Aerosol Optical Depth 550 nm (MOD08_M3 v2)
<input type="checkbox"/>	Aerosol Optical Depth 550 nm (MOD08_M3 v2)

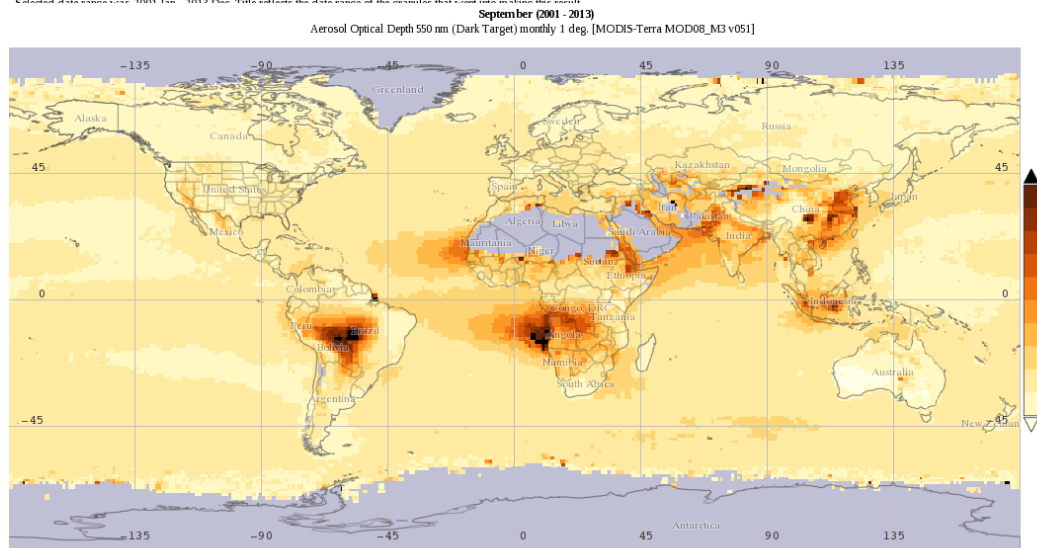


User-Defined Climatology



MODIS Monthly AOD

March, 2001-2013



September, 2001-2013

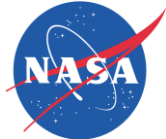
[Click Here to Repeat](#)

Comparison of aerosol regimes in March vs. Sept.
over 2001-2013. (Courtesy Suhung Shen)

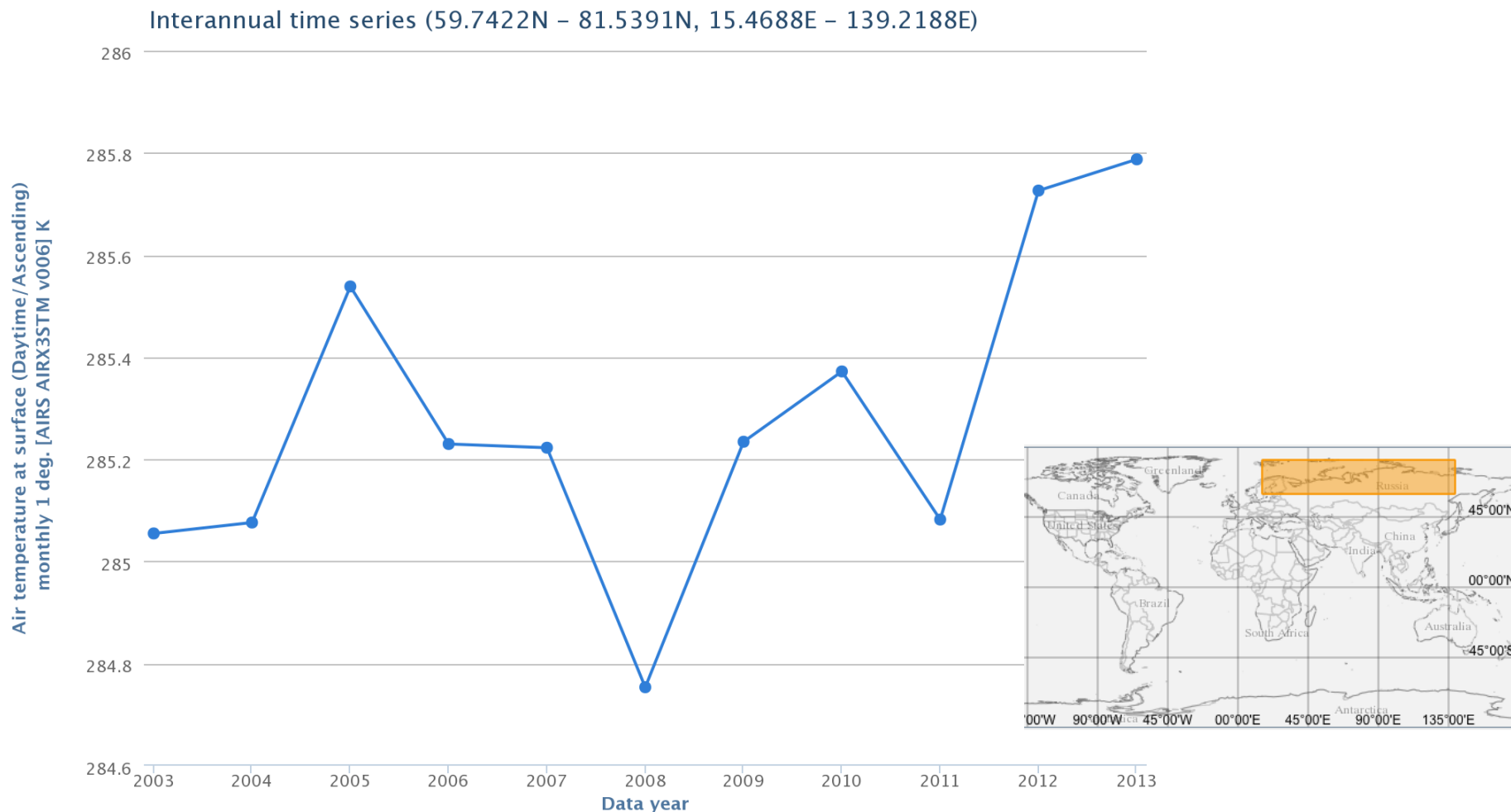


Seasonal Analysis: Interannual Time Series

- Available for Monthly data
- Plot the area average for <month> for the years <start> to <end>

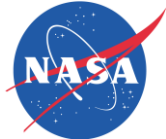


Interannual Time Series Example



Strong summer (July) warming, on the order of 0.5K/dec during the past decade, is observed by AIRS over the permafrost of the Tundra region. (Courtesy Andrey Savtchenko)

[Click here to repeat](#)



Shapefile Support

- Area-Averaged Time Series
- Coming soon...time-averaged map, histogram
- Limitations: does not work across dateline

Time Series: Area-Averaged

Select Region (Bounding Box or Shapefile)

Format: West, South, East, North

23 hrs

Countries : Dominican Republic

Show Map Show Shapes

Shape Files

US States

Countries

Shape

Denmark

Djibouti

Dominica

Dominican Republic

Ecuador

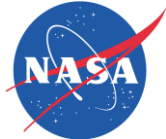
Egypt

El Salvador

Equatorial Guinea

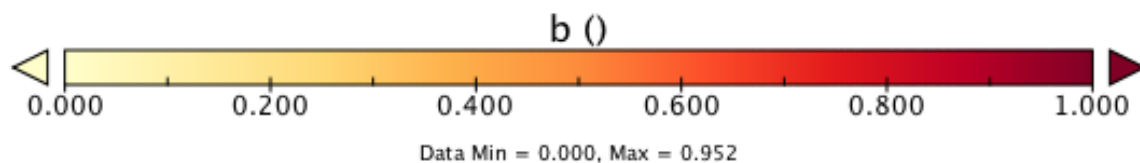
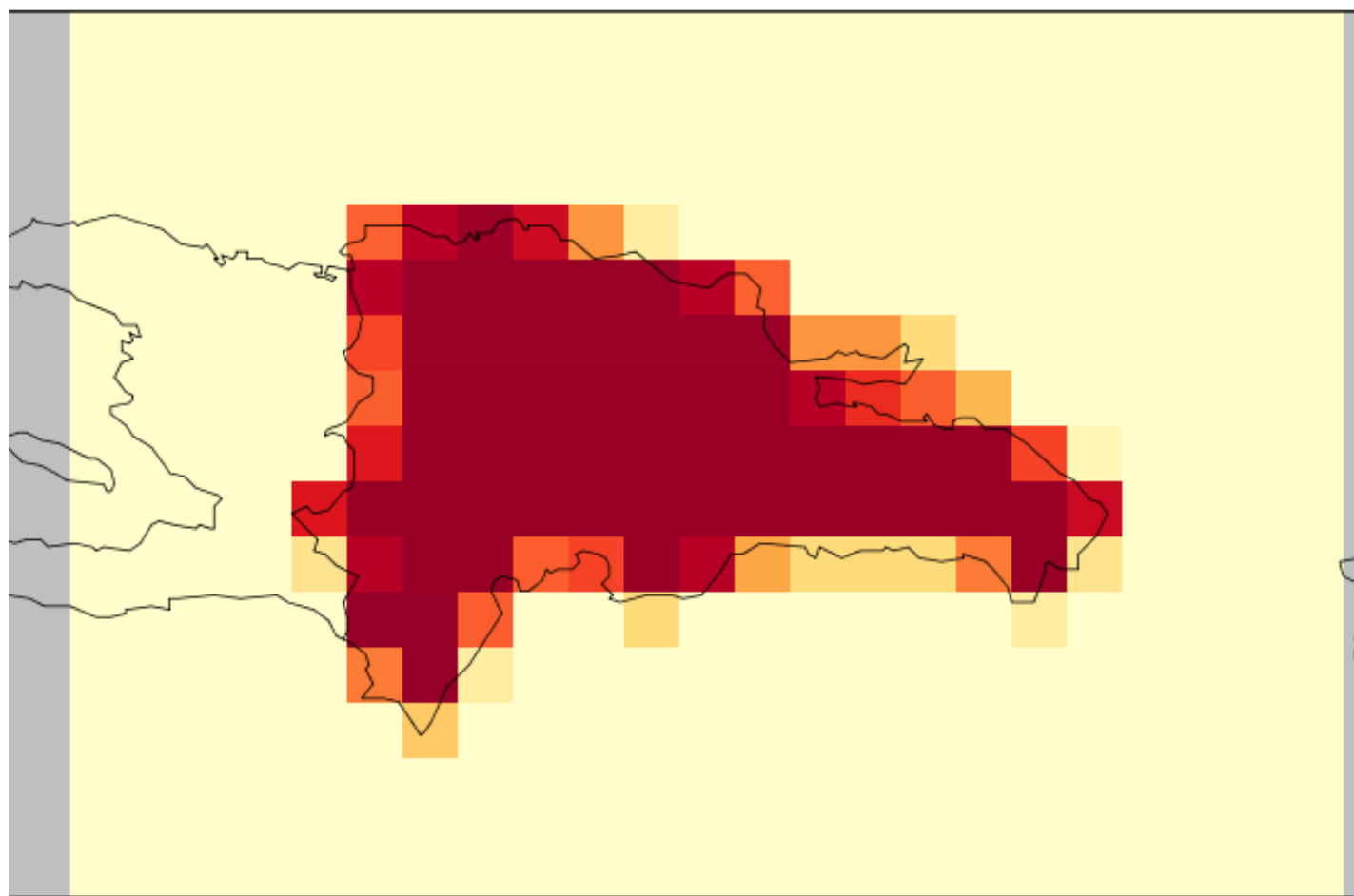
Done Clear Shape Selection

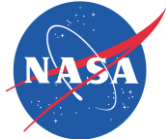
Variable Name	Model	Time
Precipitation P		
Precipitation		
Precipitation T		
Wind Velocity		
Evapotranspiration (v002)		
Soil Moisture Content Layer 1 (0-10 cm) (NLDAS_NOAH0125_H v002)	NLDAS Model	Hourly
Soil Moisture Content Top 1 Meter (0-100	NLDAS	



Shapefile-based Area Averaged Time Series

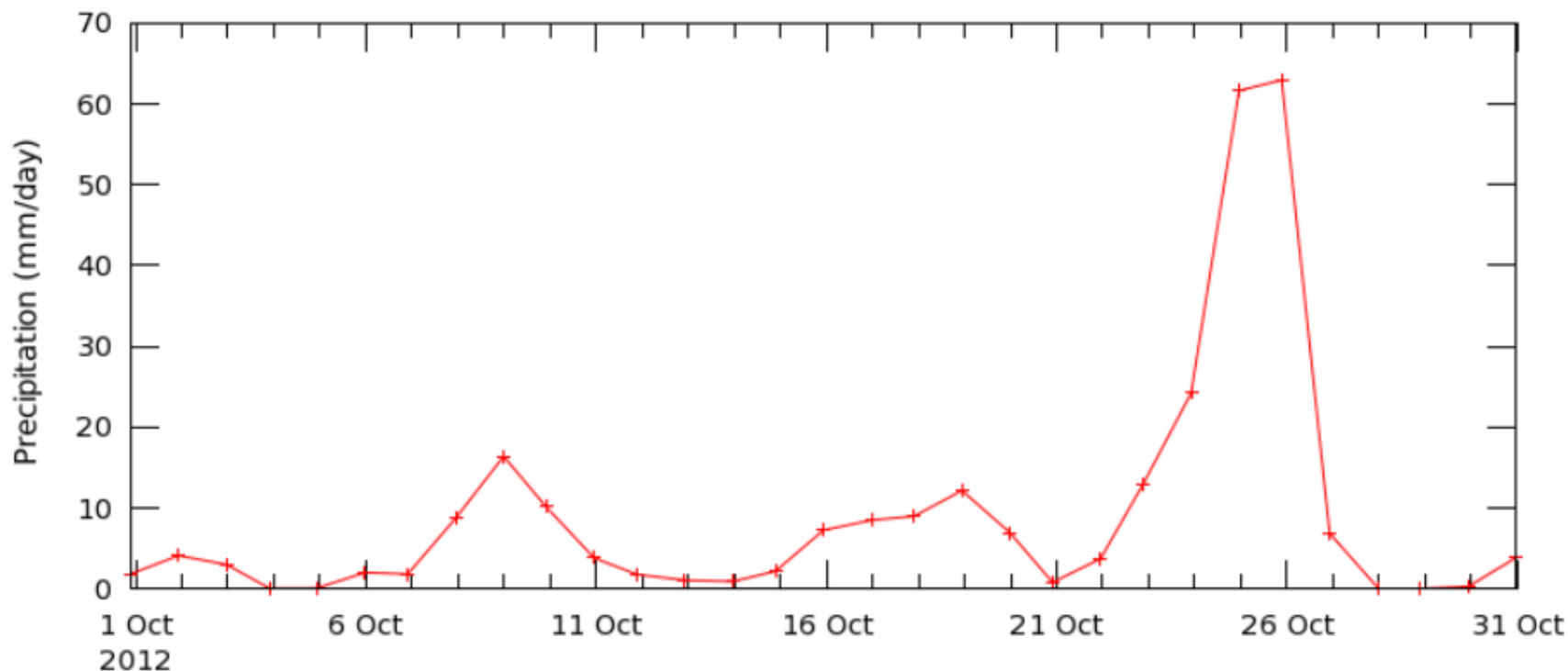
Compute average over area, weighted by % coverage by shape and $\cos(\text{lat})$





Shapefile-based Area Averaged Time Series

Time Series, Area-Averaged of Precipitation Rate daily 0.25 deg. [TRMM
TRMM_3B42_daily v7] mm/day over 2012-09-30 22:30Z - 2012-10-31 22:29Z,
Shape Dominican Republic

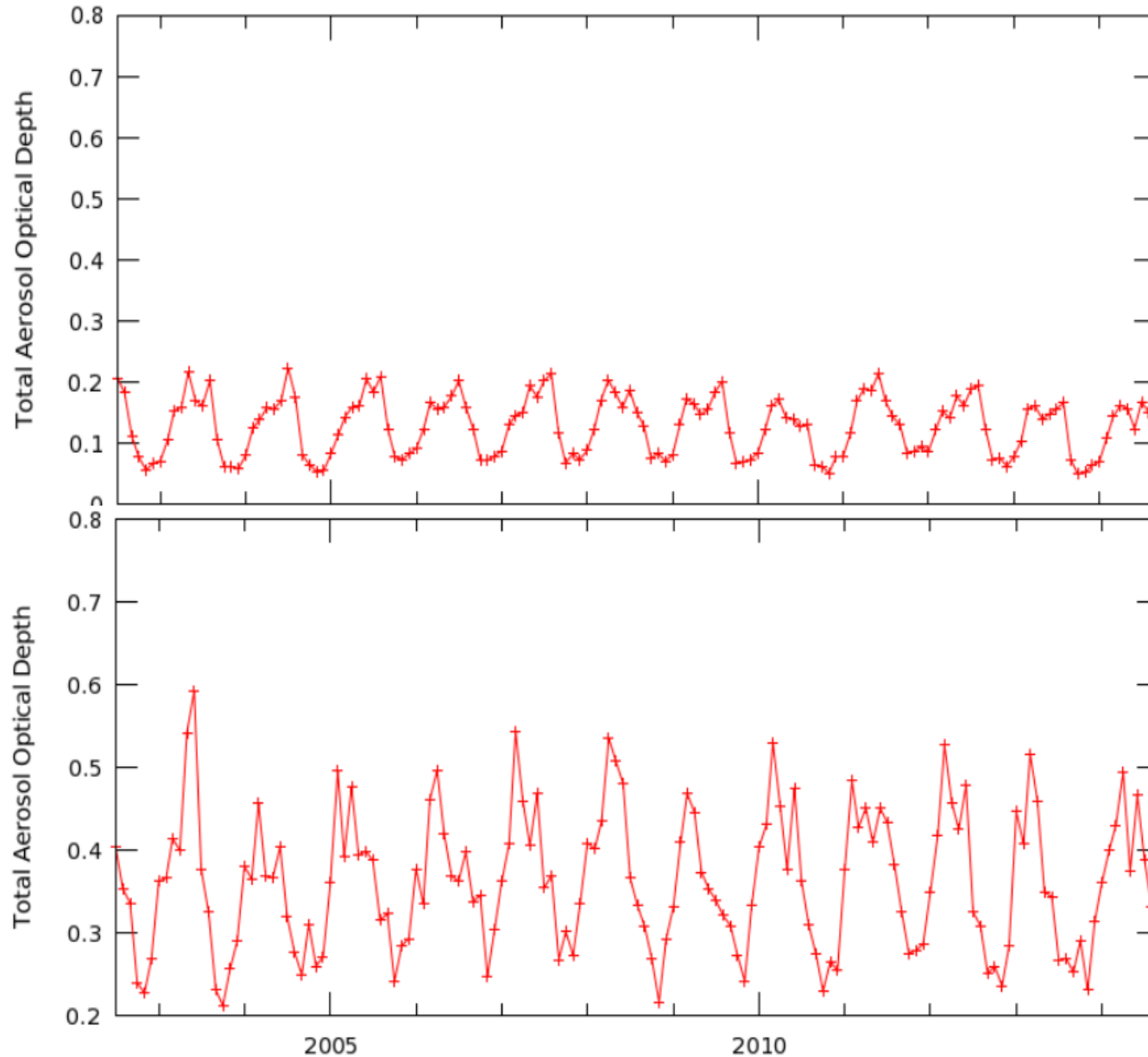


- Selected date range was 2012-10-01 - 2012-10-31. Title reflects the date range of the granules that went into making this result.

TRMM Rainfall for Oct. 2012, showing Hurricane Sandy landfall.
(Courtesy Zhong Liu)



Shapefile based Computation of MODIS-Terra Monthly AOD



U.S.

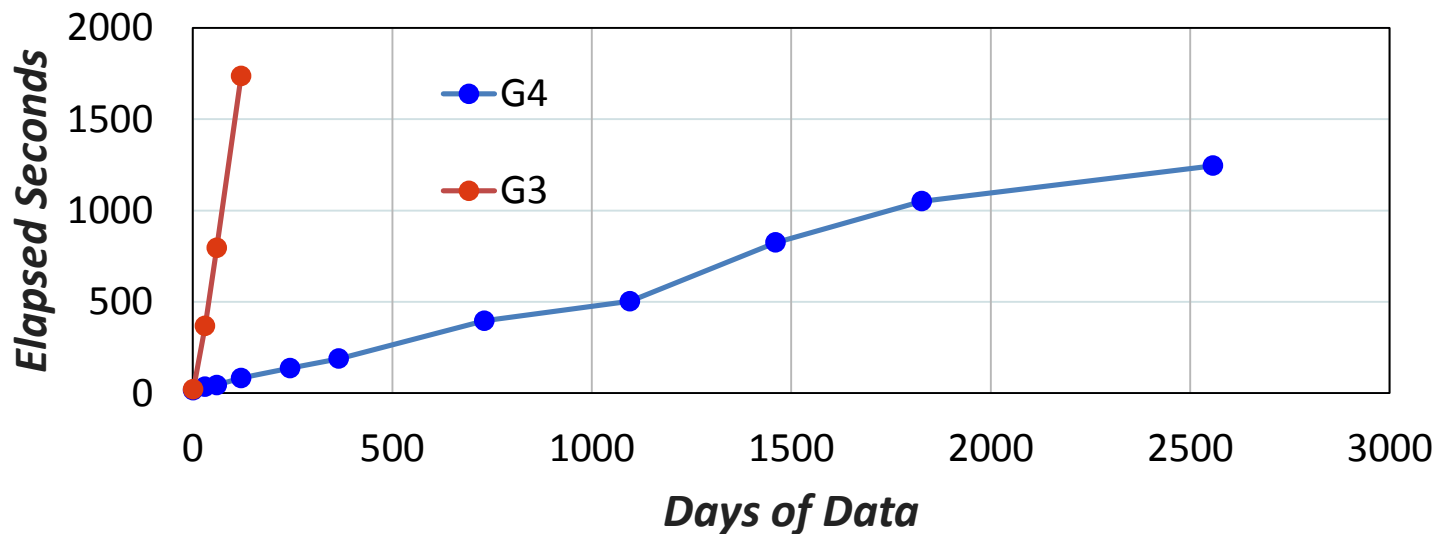
China

*Courtesy
Jennifer Wei*

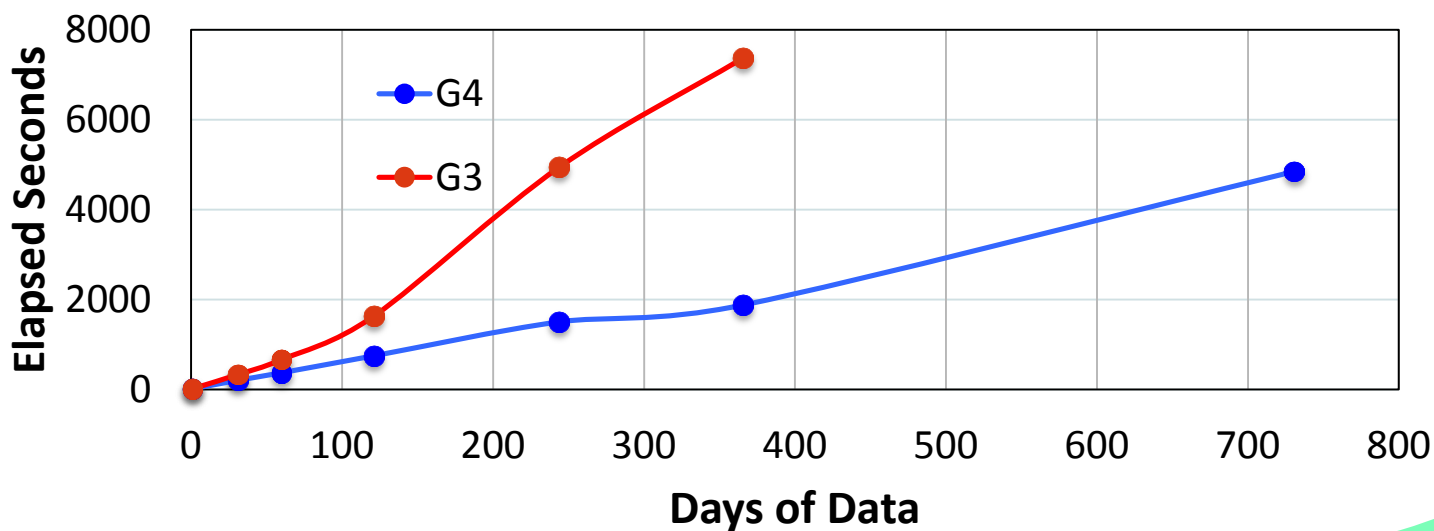


Giovanni 4 Performance

Time Averaged Map



Area-averaged Time Series





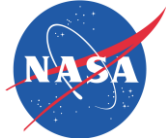
DISCUSS...



Features Still on the TO DO list

- ☐ *Pre-computed Climatology (up next)*
- ☐ OMI Level 2G
- ☐ Level 2 data support
- ☐ Cross sections (Z-Lat, Z-Lon, Z-Time)
- ☐ Time series of area statistics
- ☐ Zonal mean
- ☐ Multi-variable plots (overlays)
- ☐ Web Coverage Service interface
- ☐ MyGiovanni: user-contributed color palettes, shapefiles, data, algorithms
- ☐ Geometric Mean
- ☐ Units conversion
- ☐ More download options (KMZ, more ASCII, batch)

Your input can help us prioritize them



Giovanni was designed for exploratory data analysis...

1. ...Should Giovanni evolve to support the Main Analysis Phase better?
2. What modifications would enhance “scientific rigor”?

